A. Nelson

1638

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RAW SEQUENCE LISTING DATE: 03/27/2001
PATENT APPLICATION: US/09/549,848B TIME: 07:25:24

Input Set : A:\17133US2.txt
Output Set: N:\CRF3\03272001\I549848B.raw

<110> APPLICANT: Lassner, Michael
Post-Beittenmiller, Dusty
Savidge, Beth
Weiss, James
<120> TITLE OF INVENTION: Nucleic Acid Sequences Involved in Tocopherol Synthesis
<130> FILE REFERENCE: 17133/02/US
<140> CURRENT APPLICATION NUMBER: 09/549,848B
<141> CURRENT FILING DATE: 2000-04-14
<150> PRIOR APPLICATION NUMBER: 60/129,899
<151> PRIOR FILING DATE: 1999-04-15
<150> PRIOR APPLICATION NUMBER: 60/146,461
<151> PRIOR FILING DATE: 1999-07-30
<160> NUMBER OF SEQ ID NOS: 94
<170> SOFTWARE: FastSEQ for Windows Version 4.0
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<211> LENGTH: 1182
<212> TYPE: DNA
<213> ORGANISM: Arabidopsis sp
<400> SEQUENCE: 1

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aagcagaatc taaagctcca ctctttatca gaaatccgag ttctgcgttg tgattcgagt 120
aaagttgtcg caaaaccgaa gtttaggaac aatcttgtta ggcctgatgg tcaaggatct 180
tcattgttgt tgtatccaaa acataagtcg agatttcggg ttaatgccac tgcgggtcag 240
cctgaggctt tcgactcgaa tagcaaacag aagtctttta gagactcgtt agatgcgttt 300
tacaggtttt ctaggcctca tacagttatt ggcacagtgc ttagcatttt atctgtatct 360
ttcttagcag tagagaaggt ttctgatata tctcctttac ttttcactgg catcttggag 420
gctgttgttg cagctctcat gatgaacatt tacatagttg ggctaaatca gttgtctgat 480
gttgaaatag ataaggttaa caagccctat cttccattgg catcaggaga atattctgtt 540
aacaccggca ttgcaatagt agcttccttc tccatcatga gtttctggct tgggtggatt 600
gttggttcat ggccattgtt ctgggctctt tttgtgagtt tcatgctcgg tactgcatac 660
tctatcaatt tgccactttt acggtggaaa agatttgcat tggttgcagc aatgtgtatc 720
ctcgctgtcc gagctattat tgttcaaatc gccttttatc tacatattca gacacatgtg 780
tttggaagac caatcttgtt cactaggcct cttattttcg ccactgcgtt tatgagcttt 840
ttctctgtcg ttattgcatt gtttaaggat atacctgata tcgaagggga taagatattc 900
ggaatccgat cattctctgt aactctgggt cagaaacggg tgttttggac atgtgttaca 960
ctacttcaaa tggcttacgc tgttgcaatt ctagttggag ccacatctcc attcatatgg 1020
agcaaagtca tctcggttgt gggtcatgtt atactcgcaa caactttgtg ggctcgagct 1080
aagtccgttg atctgagtag caaaaccgaa ataacttcat gttatatgtt catatggaag 1140
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<210> SEQ ID NO: 2
<211> LENGTH: 393
<212> TYPE: PRT
<213> ORGANISM: Arabidopsis sp
<400> SEQUENCE: 2

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1 5 10 15

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62 Phe Cys Trp Lys Lys Gln Asn Leu Lys Leu His Ser Leu Ser Glu Ile
63             20                  25                  30
64 Arg Val Leu Arg Cys Asp Ser Ser Lys Val Val Ala Lys Pro Lys Phe
65         35                  40                  45
66 Arg Asn Asn Leu Val Arg Pro Asp Gly Gln Gly Ser Ser Leu Leu Leu
67     50                  55                  60
68 Tyr Pro Lys His Lys Ser Arg Phe Arg Val Asn Ala Thr Ala Gly Gln
69 65                  70                  75                  80
70 Pro Glu Ala Phe Asp Ser Asn Ser Lys Gln Lys Ser Phe Arg Asp Ser
71                 85                  90                  95
72 Leu Asp Ala Phe Tyr Arg Phe Ser Arg Pro His Thr Val Ile Gly Thr
73             100                 105                 110
74 Val Leu Ser Ile Leu Ser Val Ser Phe Leu Ala Val Glu Lys Val Ser
75         115                 120                 125
76 Asp Ile Ser Pro Leu Leu Phe Thr Gly Ile Leu Glu Ala Val Val Ala
77     130                 135                 140
78 Ala Leu Met Met Asn Ile Tyr Ile Val Gly Leu Asn Gln Leu Ser Asp
79 145                 150                 155                 160
80 Val Glu Ile Asp Lys Val Asn Lys Pro Tyr Leu Pro Leu Ala Ser Gly
81                 165                 170                 175
82 Glu Tyr Ser Val Asn Thr Gly Ile Ala Ile Val Ala Ser Phe Ser Ile
83             180                 185                 190
84 Met Ser Phe Trp Leu Gly Trp Ile Val Gly Ser Trp Pro Leu Phe Trp
85         195                 200                 205
86 Ala Leu Phe Val Ser Phe Met Leu Gly Thr Ala Tyr Ser Ile Asn Leu
87     210                 215                 220
88 Pro Leu Leu Arg Trp Lys Arg Phe Ala Leu Val Ala Ala Met Cys Ile
89 225                 230                 235                 240
90 Leu Ala Val Arg Ala Ile Ile Val Gln Ile Ala Phe Tyr Leu His Ile
91                 245                 250                 255
92 Gln Thr His Val Phe Gly Arg Pro Ile Leu Phe Thr Arg Pro Leu Ile
93             260                 265                 270
94 Phe Ala Thr Ala Phe Met Ser Phe Phe Ser Val Val Ile Ala Leu Phe
95         275                 280                 285
96 Lys Asp Ile Pro Asp Ile Glu Gly Asp Lys Ile Phe Gly Ile Arg Ser
97     290                 295                 300
98 Phe Ser Val Thr Leu Gly Gln Lys Arg Val Phe Trp Thr Cys Val Thr
99 305                 310                 315                 320
100 Leu Leu Gln Met Ala Tyr Ala Val Ala Ile Leu Val Gly Ala Thr Ser
101                325                 330                 335
102 Pro Phe Ile Trp Ser Lys Val Ile Ser Val Val Gly His Val Ile Leu
103            340                 345                 350
104 Ala Thr Thr Leu Trp Ala Arg Ala Lys Ser Val Asp Leu Ser Ser Lys
105        355                 360                 365
106 Thr Glu Ile Thr Ser Cys Tyr Met Phe Ile Trp Lys Leu Phe Tyr Ala
107    370                 375                 380
108 Glu Tyr Leu Leu Leu Pro Phe Leu Lys
109 385                 390
111 <210> SEQ ID NO: 3
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RAW SEQUENCE LISTING DATE: 03/27/2001
PATENT APPLICATION: US/09/549,848B TIME: 07:25:24

Input Set : A:\17133US2.txt
Output Set: N:\CRF3\03272001\I549848B.raw

<211> LENGTH: 1224
<212> TYPE: DNA
<213> ORGANISM: Arabidopsis sp
<400> SEQUENCE: 3
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actacccatt acacaaatcc tttcactaag tgttatcctt catggaatga taattaccaa 180
gtatggagta aaggaagaga attgcatcag gagaagtttt ttggtgttgg ttggaattac 240
agattaattt gtggaatgtc gtcgtcttct tcggttttgg agggaaagcc gaagaaagat 300
gataaggaga agagtgatgg tgttgttgtt aagaaagctt cttggataga tttgtattta 360
ccagaagaag ttagaggtta tgctaagctt gctcgattgg ataaacccat tggaacttgg 420
ttgcttgcgt ggccttgtat gtggtcgatt gcgttggctg ctgatcctgg aagccttcca 480
agttttaaat atatggcttt atttggttgc ggagcattac ttcttagagg tgctggttgt 540
actataaatg atctgcttga tcaggacata gatacaaagg ttgatcgtac aaaactaaga 600
cctatcgcca gtggtctttt gacaccattt caagggattg gatttctcgg gctgcagttg 660
cttttaggct tagggattct tctccaactt aacaattaca gccgtgtttt aggggcttca 720
tctttgttac ttgtcttttc ctacccactt atgaagaggt ttacattttg gcctcaagcc 780
tttttaggtt tgaccataaa ctggggagca ttgttaggat ggactgcagt taaaggaagc 840
atagcaccat ctattgtact ccctctctat ctctccggag tctgctggac ccttgtttat 900
gatactattt atgcacatca ggacaaagaa gatgatgtaa aagttggtgt taagtcaaca 960
gcccttagat tcggtgataa tacaaagctt tggttaactg gatttggcac agcatccata 1020
ggttttcttg cactttctgg attcagtgca gatctcgggt ggcaatatta cgcatcactg 1080
gccgctgcat caggacagtt aggatggcaa atagggacag ctgacttatc atctggtgct 1140
gactgcagta gaaaatttgt gtcgaacaag tggtttggtg ctattatatt tagtggagtt 1200
gtacttggaa gaagttttca ataa 1224
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<211> LENGTH: 407
<212> TYPE: PRT
<213> ORGANISM: Arabidopsis sp
<400> SEQUENCE: 4
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1 5 10 15
Ser Val Ser Val Thr Pro Ser Ser Ser Ser Ala Leu Leu Gln Ser Gln
20 25 30
His Lys Ser Leu Ser Asn Pro Val Thr Thr His Tyr Thr Asn Pro Phe
35 40 45
Thr Lys Cys Tyr Pro Ser Trp Asn Asp Asn Tyr Gln Val Trp Ser Lys
50 55 60
Gly Arg Glu Leu His Gln Glu Lys Phe Phe Gly Val Gly Trp Asn Tyr
65 70 75 80
Arg Leu Ile Cys Gly Met Ser Ser Ser Ser Ser Val Leu Glu Gly Lys
85 90 95
Pro Lys Lys Asp Asp Lys Glu Lys Ser Asp Gly Val Val Val Lys Lys
100 105 110
Ala Ser Trp Ile Asp Leu Tyr Leu Pro Glu Glu Val Arg Gly Tyr Ala
115 120 125
Lys Leu Ala Arg Leu Asp Lys Pro Ile Gly Thr Trp Leu Leu Ala Trp
130 135 140
Pro Cys Met Trp Ser Ile Ala Leu Ala Ala Asp Pro Gly Ser Leu Pro

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PATENT APPLICATION: US/09/549,848B TIME: 07:25:24

Input Set : A:\17133US2.txt
Output Set: N:\CRF3\03272001\I549848B.raw

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164 145                 150                 155                 160
165 Ser Phe Lys Tyr Met Ala Leu Phe Gly Cys Gly Ala Leu Leu Leu Arg
166                 165                 170                 175
167 Gly Ala Gly Cys Thr Ile Asn Asp Leu Leu Asp Gln Asp Ile Asp Thr
168             180                 185                 190
169 Lys Val Asp Arg Thr Lys Leu Arg Pro Ile Ala Ser Gly Leu Leu Thr
170         195                 200                 205
171 Pro Phe Gln Gly Ile Gly Phe Leu Gly Leu Gln Leu Leu Leu Gly Leu
172     210                 215                 220
173 Gly Ile Leu Leu Gln Leu Asn Asn Tyr Ser Arg Val Leu Gly Ala Ser
174 225                 230                 235                 240
175 Ser Leu Leu Leu Val Phe Ser Tyr Pro Leu Met Lys Arg Phe Thr Phe
176                 245                 250                 255
177 Trp Pro Gln Ala Phe Leu Gly Leu Thr Ile Asn Trp Gly Ala Leu Leu
178             260                 265                 270
179 Gly Trp Thr Ala Val Lys Gly Ser Ile Ala Pro Ser Ile Val Leu Pro
180         275                 280                 285
181 Leu Tyr Leu Ser Gly Val Cys Trp Thr Leu Val Tyr Asp Thr Ile Tyr
182     290                 295                 300
183 Ala His Gln Asp Lys Glu Asp Asp Val Lys Val Gly Val Lys Ser Thr
184 305                 310                 315                 320
185 Ala Leu Arg Phe Gly Asp Asn Thr Lys Leu Trp Leu Thr Gly Phe Gly
186                 325                 330                 335
187 Thr Ala Ser Ile Gly Phe Leu Ala Leu Ser Gly Phe Ser Ala Asp Leu
188             340                 345                 350
189 Gly Trp Gln Tyr Tyr Ala Ser Leu Ala Ala Ala Ser Gly Gln Leu Gly
190         355                 360                 365
191 Trp Gln Ile Gly Thr Ala Asp Leu Ser Ser Gly Ala Asp Cys Ser Arg
192     370                 375                 380
193 Lys Phe Val Ser Asn Lys Trp Phe Gly Ala Ile Ile Phe Ser Gly Val
194 385                 390                 395                 400
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196                 405
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199 <211> LENGTH: 1296
200 <212> TYPE: DNA
201 <213> ORGANISM: Arabidopsis sp
203 <400> SEQUENCE: 5
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205 ccaaacccta gactgattcc ttggtcccgc gaattatgtg ccgttaatag cttctcccag     120
206 cctccggtct cgacggaatc aactgctaag ttagggatca ctggtgttag atctgatgcc     180
207 aatcgagttt ttgccactgc tactgccgcc gctacagcta cagctaccac cggtgagatt     240
208 tcgtctagag ttgcggcttt ggctggatta gggcatcact acgctcgttg ttattgggag     300
209 ctttctaaag ctaaacttag tatgcttgtg gttgcaactt ctggaactgg gtatattctg     360
210 ggtacgggaa atgctgcaat tagcttcccg gggctttgtt acacatgtgc aggaaccatg     420
211 atgattgctg catctgctaa ttccttgaat cagatttttg agataagcaa tgattctaag     480
212 atgaaaagaa cgatgctaag gccattgcct tcaggacgta ttagtgttcc acacgctgtt     540
213 gcatgggcta ctattgctgg tgcttctggt gcttgtttgt tggccagcaa gactaatatg     600
214 ttggctgctg gacttgcatc tgccaatctt gtactttatg cgtttgttta tactccgttg     660
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RAW SEQUENCE LISTING DATE: 03/27/2001
PATENT APPLICATION: US/09/549,848B TIME: 07:25:24

Input Set : A:\17133US2.txt
Output Set: N:\CRF3\03272001\I549848B.raw

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215 aagcaacttc accctatcaa tacatgggtt ggcgctgttg ttggtgctat cccacccttg     720
216 cttgggtggg cggcagcgtc tggtcagatt tcatacaatt cgatgattct tccagctgct     780
217 ctttactttt ggcagatacc tcattttatg gcccttgcac atctctgccg caatgattat     840
218 gcagctggag gttacaagat gttgtcactc tttgatccgt cagggaagag aatagcagca     900
219 gtggctctaa ggaactgctt ttacatgatc cctctcggtt tcatcgccta tgactggggg     960
220 ttaacctcaa gttggttttg cctcgaatca acacttctca cactagcaat cgctgcaaca    1020
221 gcattttcat tctaccgaga ccggaccatg cataaagcaa ggaaaatgtt ccatgccagt    1080
222 cttctcttcc ttcctgtttt catgtctggt cttcttctac accgtgtctc taatgataat    1140
223 cagcaacaac tcgtagaaga agccggatta acaaattctg tatctggtga agtcaaaact    1200
224 cagaggcgaa agaaacgtgt ggctcaacct ccggtggctt atgcctctgc tgcaccgttt    1260
225 cctttcctcc cagctccttc cttctactct ccatga                              1296
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228 <211> LENGTH: 431
229 <212> TYPE: PRT
230 <213> ORGANISM: Arabidopsis sp
232 <400> SEQUENCE: 6
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235 Ser Ser Ser Leu Pro Asn Pro Arg Leu Ile Pro Trp Ser Arg Glu Leu
236             20                  25                  30
237 Cys Ala Val Asn Ser Phe Ser Gln Pro Pro Val Ser Thr Glu Ser Thr
238         35                  40                  45
239 Ala Lys Leu Gly Ile Thr Gly Val Arg Ser Asp Ala Asn Arg Val Phe
240     50                  55                  60
241 Ala Thr Ala Thr Ala Ala Ala Thr Ala Thr Ala Thr Thr Gly Glu Ile
242 65                  70                  75                  80
243 Ser Ser Arg Val Ala Ala Leu Ala Gly Leu Gly His His Tyr Ala Arg
244                 85                  90                  95
245 Cys Tyr Trp Glu Leu Ser Lys Ala Lys Leu Ser Met Leu Val Val Ala
246             100                 105                 110
247 Thr Ser Gly Thr Gly Tyr Ile Leu Gly Thr Gly Asn Ala Ala Ile Ser
248         115                 120                 125
249 Phe Pro Gly Leu Cys Tyr Thr Cys Ala Gly Thr Met Met Ile Ala Ala
250     130                 135                 140
251 Ser Ala Asn Ser Leu Asn Gln Ile Phe Glu Ile Ser Asn Asp Ser Lys
252 145                 150                 155                 160
253 Met Lys Arg Thr Met Leu Arg Pro Leu Pro Ser Gly Arg Ile Ser Val
254                 165                 170                 175
255 Pro His Ala Val Ala Trp Ala Thr Ile Ala Gly Ala Ser Gly Ala Cys
256             180                 185                 190
257 Leu Leu Ala Ser Lys Thr Asn Met Leu Ala Ala Gly Leu Ala Ser Ala
258         195                 200                 205
259 Asn Leu Val Leu Tyr Ala Phe Val Tyr Thr Pro Leu Lys Gln Leu His
260     210                 215                 220
261 Pro Ile Asn Thr Trp Val Gly Ala Val Val Gly Ala Ile Pro Pro Leu
262 225                 230                 235                 240
263 Leu Gly Trp Ala Ala Ala Ser Gly Gln Ile Ser Tyr Asn Ser Met Ile
264                 245                 250                 255
265 Leu Pro Ala Ala Leu Tyr Phe Trp Gln Ile Pro His Phe Met Ala Leu
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FYI

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

VERIFICATION SUMMARY DATE: 03/27/2001
PATENT APPLICATION: US/09/549,848B TIME: 07:25:25

Input Set : A:\17133US2.txt
Output Set: N:\CRF3\03272001\I549848B.raw

L:314 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8
L:315 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8
L:679 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22
L:680 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22
L:681 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:22
L:760 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:25
L:773 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:26
L:790 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27
L:791 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27
L:793 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:27